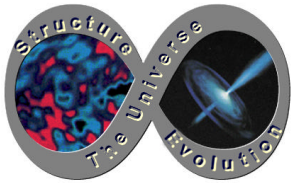
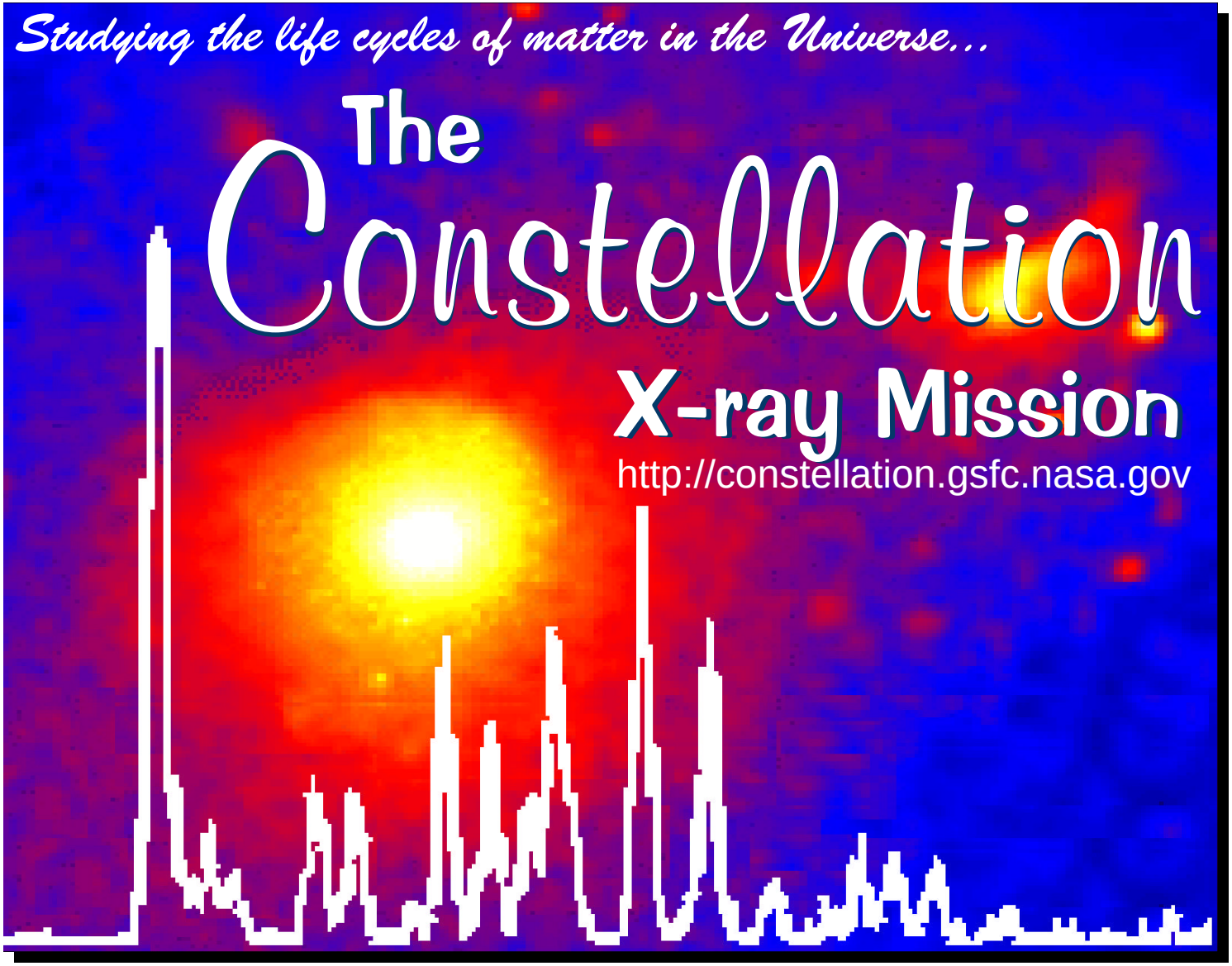


Introduction to Constellation-X

The Constellation X-ray Mission



X-ray Observatories Timeline

Constellation-X

Upcoming Missions:

AXAF
Spectrum XG
XMM
Astro-E

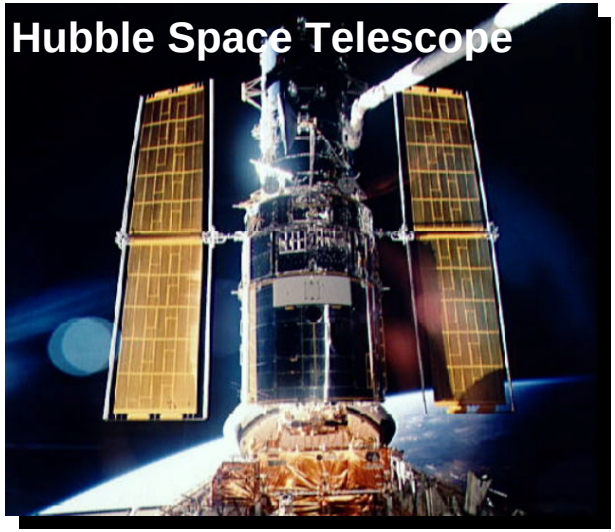
Current Missions:

ROSAT
ASCA
RXTE
BeppoSAX

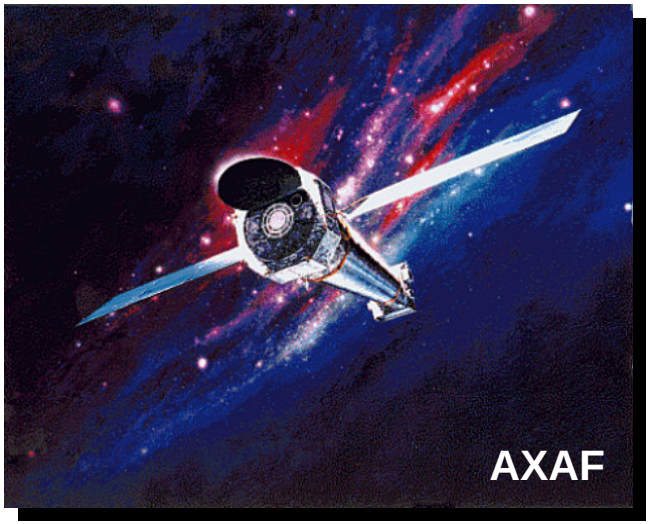
1996 1998 2000 2002 2004 2006 2008 2010

X-ray Equivalent of the Keck Telescope

Imaging



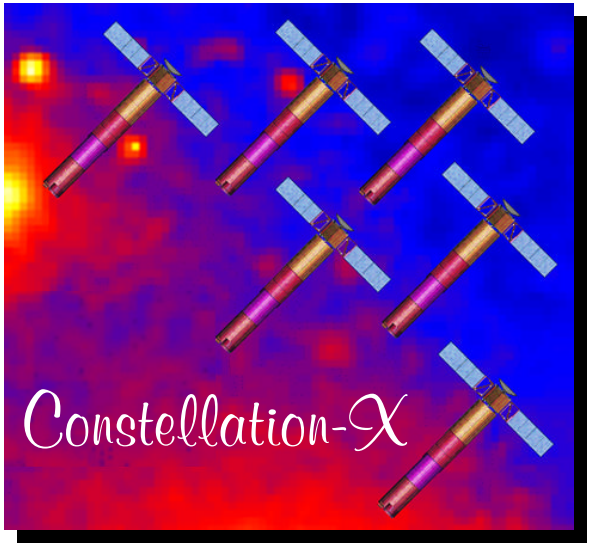
0.1 arc sec
40,000 cm^2



0.6 arc sec
1,000 cm^2
(100 cm^2)*

Spectroscopy

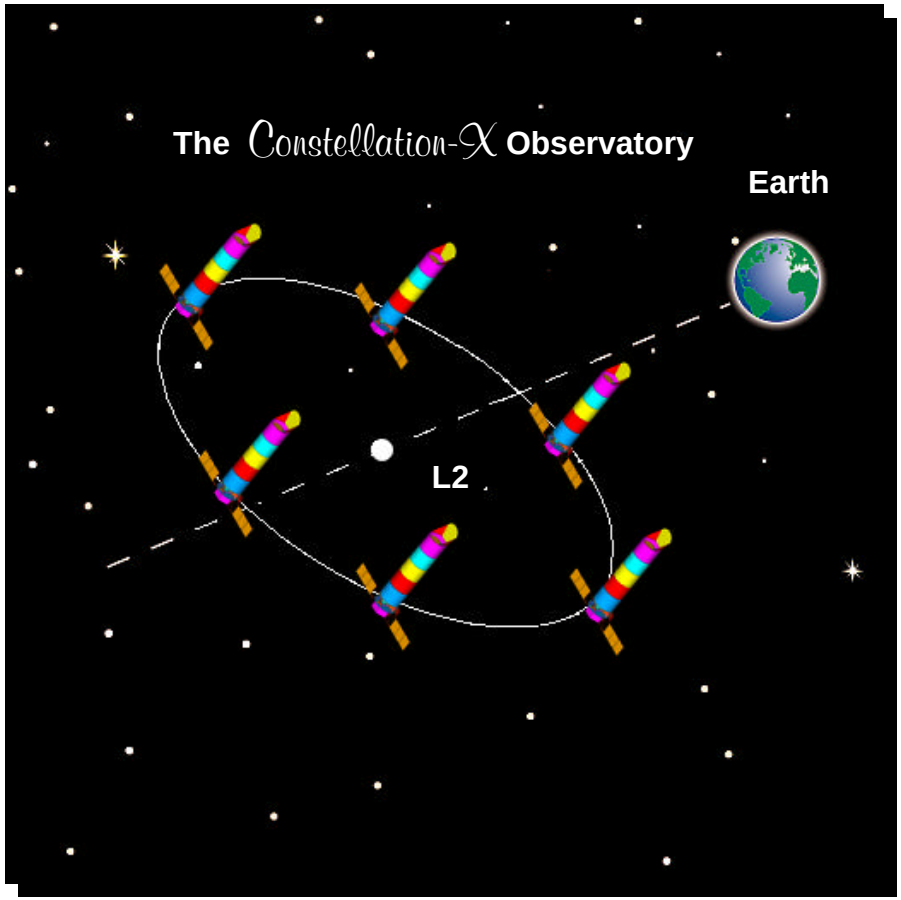
1 arc sec
780,000 cm^2



15 arc sec
30,000 cm^2
(15,000 cm^2)*

* effective area at the spectrometer

The Constellation-X Multi-satellite Approach to Large Collecting Area



To achieve 15,000 cm^2 effective area on a single satellite requires a Titan-class launch.

An alternative low-risk approach to achieve large X-ray collecting area is to utilize a constellation of six identical low-cost Delta-class satellites.

Launch intervals of three months.

Facilitate simultaneous viewing and high efficiency by using libration point orbit.

- Low-Earth orbit mission requires increased collecting area or mission life.

Spacecraft design lifetime is three years
- consumables targeted for a five-year mission

Constellation X-ray Mission
Brief Program History I

- NRA 94-OSS-15 solicits new mission concepts for astrophysics - due 12/07/94
- HTXS study formed (late 1995) by merging two peer-reviewed selected proposals:
  - The Next Generation X-ray Observatory - PI Nicholas White (NASA/GSFC)
  - Large Area X-ray Spectroscopy Mission - PI Harvey Tananbaum (SAO)

  plus elements of third accepted proposal
  - Hard X-ray Telescope - PI Paul Gorenstein (SAO)
- HTXS Interim Report submitted by Science Working Group (05/96)
- Capabilities endorsed as ***the*** priority next generation X-ray facility at Leicester workshop attended by representatives from 25 institutions (07/96)
- Mission presented to NASA Administrator Dan Goldin (07/96 and 06/97)
- High Throughput X-ray Spectroscopy Workshop held (09/96)
- HTXS Technology Roadmap issued by Science Working Group (02/97)

Constellation X-ray Mission
Brief Program History II

- Independent review and endorsement of HTXS Mission by SEUS (03/97)
- Space Science Enterprise Breckenridge Workshop includes HTXS in Strategic Plan for FY 2000-2004 (05/97)
- Jean Grady (NASA/GSFC) appointed Study/Program Manager (05/97)
- NASA HQ asks Harvey Tananbaum and Nick White to form FST (09/97)
- Name changed to Constellation X-ray Mission (10/97)
- FY98 funding approved for technology program and mission study (12/97)
- President's FY99 budget request includes funding for Constellation-X for FY99-03, but less than required (02/98)
- NRA for instrument technology development released (02/98)
- Constellation-X FST holds first meeting (02/98)
- Constellation-X Architecture Study CAN to be released (03/98)